

Notice of Allowability

Application No.

10/077,084

Examiner

Venkatesh Haliyur

Applicant(s)

HUI ET AL.

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 02/28/2007.
2. ☒ The allowed claim(s) is/are 2-10.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

Allowable Subject Matter

1. The following is an examiner's statement of reasons for allowance:

Claims 2-10 are allowed over prior art.

The prior art of record fails to teach and render obvious the limitations as amended in the independent claim 9 and the dependent claims 2-8,10 by the applicant(s) for "A method for controlling transmit diversity in a first communication device operating in a system including the first communication device and a second communication device, the first and second communication devices both having stored a pre-determined basis set $\{w_i\}$, the method comprising the steps of: (a) transmitting a packet from the first communication device to the second communication device by a transmit Diversity (TD) scheme using a first basis from $\{w_i\}$; using the same basis as in step (a) for the next packet to be transmitted by the first communication device if the second communication device sends an acknowledgement (ACK) to the first communication device; and (c) using a different basis from $\{w_i\}$ by both the first and second communication devices if the second communication device sends an negative-acknowledgement (NACK) to the first communication device in response to step (a), wherein the first communication device includes M transmit antennas and the basis is selected by both the first and the second devices from

a set of $M \times M$ rotation matrices”.

2. High Speed Downlink Packet Access (HSDPA) and IxEV-DV which are part of the 3rd Generation Partnership Project (3GPP) and 3GPP2 standards bodies for new technologies in wireless communication. Adaptive modulation and coding schemes, Hybrid-ARQ, code combining, smart antennas, etc., are being investigated and proposed for these new wireless technologies. ARQ is an implicit adaptation technique in which receiver acknowledgments regarding the transmitted packets are used for re-transmission decisions. Hybrid-ARQ (H-ARQ) is one form of ARQ schemes in which one of code combining methods is used. Time diversity offered by Hybrid ARQ has been shown to have the capability of improving system throughput. The applicant's invention relates in general to new wireless communication technologies, and more particularly to an ARQ (Automatic Repeat Request) using transmit diversity with adaptive basis or other smart antenna systems to improve system throughput and capacity as one of the main goals for high-speed wireless communication system. The present invention combines transmit diversity and ARQ schemes to explore the time diversity provided by ARQ and transmit diversity (TD) from multiple transmit and multiple receive antennas. In this method, the feedback information for ARQ is used to control the transmit diversity schemes or TD basis or TD basis for (re) transmissions. By doing so, the performance is improved as compared to techniques like H-ARQ plus open loop TD schemes as well as H-ARQ schemes

using open loop TD with randomly selected basis from a pre-determined set. This method does not add extra feedback information required by the previously mentioned closed loop TD schemes.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Venkatesh Haliyur whose telephone number is 571-272-8616. The examiner can normally be reached on Monday thru Friday 8:30AM to 4:30PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on 571-272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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4. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Venkatesh Haliyur

Patent Examiner

Wh 08/19/07

EDAN D. ORGAD
SUPERVISORY PATENT EXAMINER

Edan Orgad 8/20/07